

Remarks

Applicant has amended Claims 1, 15, 40 and 44. Applicant respectfully submits that no new matter was added by the amendment, as all of the amended matter was either previously illustrated or described in the drawings, written specification and/or claims of the present application. (*See*, p. 4, lines 19-21).

The Examiner has rejected Claims 1 – 6, 13 and 25 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,274,871 to Dukor (“the ‘871 patent”) in view of U.S. Patent No. 6,396,048 to Schanz (“the ‘048 patent”). The Examiner has further rejected Claims 26 – 43 under 35 U.S.C. §103(a) as being unpatentable over the ‘871 patent in view of the ‘048 patent and further in view of U.S. Patent No. 5,512,749 to Idan (“the ‘749 patent”). The Examiner has still further rejected Claims 8 – 12 under 35 U.S.C. §103(a) as being unpatentable over the ‘871 patent in view of the ‘048 patent and further in view of U.S. Patent No. 5,712,685 to Dumas (“the ‘685 patent”). The Examiner has yet further rejected Claim 7 under 35 U.S.C. §103(a) as being unpatentable over the ‘871 patent in view of the ‘048 patent and further in view of U.S. Patent No. 5,091,646 to Taylor (“the ‘646 patent”). The Examiner has still further rejected Claim 44 under 35 U.S.C. §103(a) as being unpatentable over the ‘871 patent in view of the ‘048 patent and further in view of U.S. Patent No. 5,123,953 to Harris (“the ‘953 patent”). These rejections are respectfully traversed. In light of the amendments to the claims and the following remarks, these rejections are respectfully traversed.

As amended, Claims 1, 25, 40, and 44 are directed in part to radiation detectors being directly fed in parallel to processing circuitry, "said array of detectors comprising from approximately 3 to 100 individual detector elements." Applicant respectfully submits that the cited references do not teach or disclose these limitations.

The Examiner has submitted that the '871 patent discloses a detector that "comprises a small array of individual detector elements ... Dukor does not specify that the outputs of the detector elements are directly fed in parallel to an image processing means." Applicant agrees with the Examiner that the '871 patent does not disclose detector elements that are directly fed in parallel to an image processing means. As a result the '871 patent does not anticipate the claimed invention.

The '871 patent also does not anticipate the claimed invention because it does not disclose 3 to 100 individual detector elements. Applicant respectfully submits that Dukor teaches that "the focal-plane array detector 62 uses a mercury-cadmium-telluride (MCT) infrared detector chip with 64x64 pixels." (Col. 4, lines 43 – 45). This array then, comprises approximately 4096 detectors. This is exactly the type of extremely expensive system the present invention identified should be avoided stating "[i]n order to reduce measurement times microscopes have been designed which incorporate large detector arrays rather than single detector elements. One such arrangement uses an integrated array of 64x64 liquid nitrogen cooled photovoltaic MCT detectors each having an area of 60 microns square . . . such arrangements however are extremely expensive

and typically cost more than 3 times that of a microscope with employs a single detector." (p. 2, line 19 - p. 3, line 7). Accordingly, all the claims of the present invention recite a detector having "from approximately 3 to 100 individual detector elements." Thus, the '871 patent does not anticipate the claimed invention.

Applicant also respectfully submits that the '048 patent does not anticipate the claimed invention. As the Examiner notes, "Schanz discloses a device to detect an optical signal and uses parallel processing." (page 10). However, the claimed invention is directed to radiation detectors with an array of detectors from 3 to 100. The '048 patent fails to teach or suggest a radiation detector having "from approximately 3 to 100 individual detector elements" as recited by all of the pending claims. As a result, the '048 patent does not anticipate the claimed invention.

Further, it is respectfully submitted that there is no suggestion or motivation to modify or combine these references in accordance with the claimed invention.

The '871 patent discloses that IR light 54 is generated by FTIR spectrometer 52 and reflected by sample 10. The IR light 54 is reflected off mirror 76, through lens 78, and received by focal plane array detector 62. When in visible light mode, a reflecting mirror 86 is moved into the light path so as to obstruct any transmission of visible light to detector 62 and visible light 86 is generated from underneath the sample 10. (col. 5

I. 3-13). A portion of the transmitted light is collected by objective 80, the other portion reflected by mirror 84 to a visualization means such as a camera. Id.

The '048 patent is not directed to IR technology or an IR microscope. Rather, the '048 patent appears to be directed toward and teaches increasing the signal-to-noise ratio of optical signals picked up by photodiodes, parasitic bipolar transistors, photogates and photosensitive MOSFETs for such applications as "improving the quality of a television picture." (Col. 1, lines 19 – 21; Col. 2, lines 4 – 21). These elements, while applicable for a broad range of applications, cannot be effectively used with an IR microscope. The Examiner notes that this reference "discloses a device to detect an optical signal." (page 10).

Based on the natures of the '871 patent and the '048 patent, combining these references would not render the claimed invention. As noted above, the '048 patent is directed to the parallel processing of an optical signal. The '871 patent is directed to a device with an IR imaging component and visible light imaging components. The detector 62 only detects IR light 54. While objective 80 and a camera detects visible light. The '871 patent does not disclose that the detector 62 can serve as both an IR detector and a visible light detector. In fact it is impossible for detector 62 to detect visible light because mirror 84 obstructs the transmission of visible light to the detector with mirror 84 when in visible light mode. Further, no where in the '871 patent does the reference disclose that the technology associated with the IR detector 62 is at all synonymous

with a visible light detector 80 or a camera. Similarly, the '048 patent only discloses the use of parallel processing in the context of visible light. If one skilled in the art were to combine these references, he or she would apply the imaging technology of the '048 patent to either a camera or objective 80, because these portions of the '871 patent are directed to detecting visible light. As a result, combining the '871 patent with the '048 patent does not yield the claimed invention.

There is also no motivation to apply the visible light technology of the '048 patent to the IR detector in the '871 patent because the '871 patent teaches away the relationship between visible light technology and IR technology. The '871 patent shows that visible light detection and IR light detection must be accomplished by separate detectors. This indicates to one skilled in the art that the technologies are not related. More particularly, neither reference indicates that the two technologies are in fact related or interchangeable. As a result, one skilled in the art would not be motivated to apply the teaching of the '048 patent for visible light imaging to the IR detector in the '871 patent.

The '871 patent also teaches away the use of 3 to 100 individual radiation detector elements. The '871 patent states that with 4096 detectors a "significant advantage of this technique as compared to more conventional infrared microspectroscopy is the parallel infrared detection of a relatively large number of pixels, which eliminates the need of point-by-point mapping of the sample. This parallel detection significantly re-

duces the time required to collect infrared spectra of a given sample.” Thus, the ‘871 patent is simply saying more is better. The present invention reduces the number of detectors and provides for parallel processing because the read-out noise is reducing the performance of the focal plane array. (par. [0005]). The ‘871 patent provides no indication that such a relationship exists and thus provides no motivation to one skilled in the art to seek a smaller detector array. Further, given the complexity associated with calculating FTIR signal/noise ratios, one skilled in the art would not readily look to limiting the number of detector elements to 3 to 100 detectors. As a result, one skilled in the art would not be motivated by the ‘871 patent to modify the reference in accordance with the claimed invention.

It is well settled that the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990). If one were to select the detection elements from the ‘871 patent to be combined with the detection circuitry of the ‘048 patent it is doubtful that these would be compatible. While the detection circuitry of the ‘048 patent is directed toward use with photodiodes, transistors, photogates, the ‘871 patent teaches that mercury-cadmium-telluride (MCT) infrared detector chips are used for the detection elements. (‘871 patent, Col. 1, lines 19 – 21; ‘048 patent, Col. 4, lines 43 – 45). Nowhere however does it state in either reference that the output of the detection elements in the ‘871 patent would be

compatible with the detection circuitry of the '048 patent, which is directed toward a different technology.

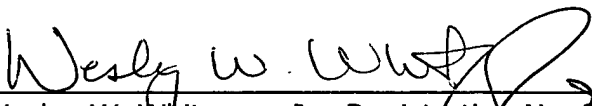
It is also well settled that if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Even if one were to combine the '871 patent with the '048 patent, the resulting device would be very large in size, extremely costly and probably would not even function. The '871 patent teaches the use of a 4096 detector array. (Col. 4, lines 43 – 45). This is exactly the problem the present application identified as a major drawback of present systems. For example, it was stated that “[i]n order to reduce measurement times microscopes have been designed which incorporate large detector arrays rather than single detector elements. One such arrangement uses an integrated array of 64x64 liquid nitrogen cooled photovoltaic MCT detectors each having an area of 60 microns square . . . such arrangements however are extremely expensive and typically cost more than 3 times that of a microscope with employs a single detector.” (pp. 2 – 3). In addition, the system probably would not work, as stated in the application a relatively “small detector array will typically comprise between 3 and 100 detector elements. Typically the upper limit will be 64 and a preferred arrangement will have 16.” (p. 4). Providing upwards of 4100 parallel fed circuit and an equal number of associated detection circuitry would not be feasible in terms of cost or size and space, and is even doubtful whether such an unwieldy system would even function.

Applicant respectfully submits that the combination of the '871 patent with the '048 patent therefore cannot be obvious.

In view of the foregoing amendments and remarks, it is respectfully submitted that all of the claims currently pending in the application are now in condition for allowance. Reconsideration and notice to that effect is earnestly requested.

Respectfully submitted,

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